

Background

Hyperemesis gravidarum (HG) is a more severe type of nausea and vomiting during pregnancy. Multiple randomized controlled trials (RCTs) have compared the superiority of metoclopramide or ondansetron in managing HG. However, these RCTs were limited by small sample sizes and conflicting findings. Additionally, these results had not been yet summarized. Hence, this first-ever systematic review and meta-analysis of RCTs aimed to examine the efficacy of ondansetron versus metoclopramide (control) in managing pregnant women with HG.

Methods

We followed the preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020 guideline.

Search criteria: PICOS criteria

Patients: patients presented to the hospital with HG

Intervention: ondansetron

Comparison: metoclopramide

Outcome: pregnancy-unique quantification of emesis and nausea (PUQE) score, length of hospital stay, number of doses of drug received, and duration of intravenous fluids

Study design: RCTs

Databases search

PubMed, Scopus, Web of science, and Cochrane Central Register of Controlled Trials (CENTRAL)

Quality assessment: Revised Cochrane risk of bias tool

Data analysis: Meta-analysis: random-effect model

Statistical test for heterogeneity: test for heterogeneity and P-value of Chi² Heterogeneity: I²

Effect size: continuous variable pooled as mean difference (MD) with confidence interval (CI)

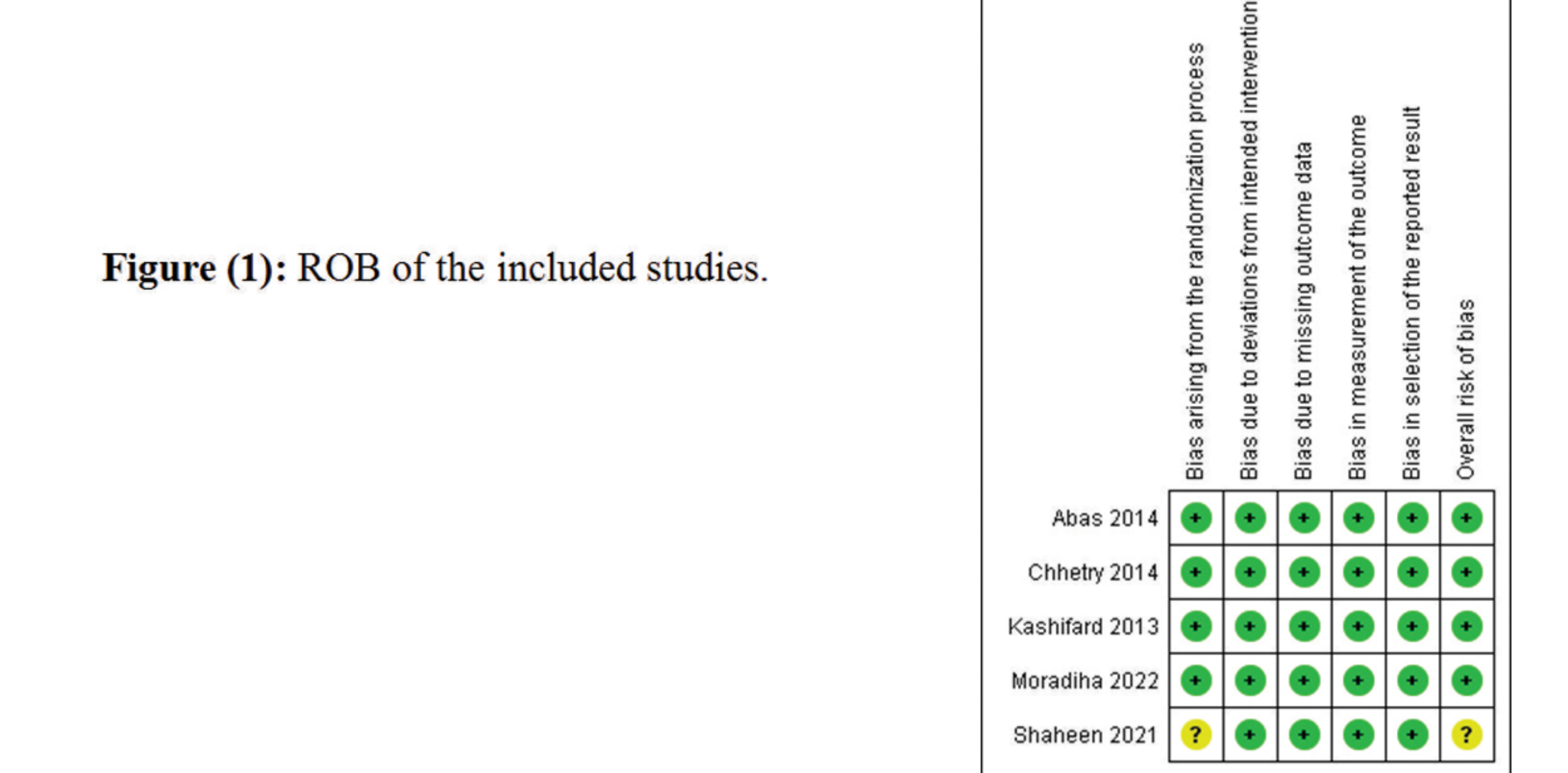
Recommendation

To conduct a multi-centric, large sample size, with defined protocol, and long-term follow-up period.

Results

Study ID	Country	Total sample size, n (intervention/control)	Route of drug administration	Study conclusion
Kashifard 2013	Iran	n=83 (49/34)	Orally three times/week, then twice/three days, then once/four days	OND was able to diminish vomiting treatment more rapidly than MET
Abas 2014	Malaysia	n=160 (80/80)	Intravenously every 8 hours for at least 24 hours and then switched into oral if patients can tolerate	OND and MET demonstrated similar antiemetic and antinauseant effects in HG
Chhetry 2014	Nepal	n=68 (34/34)	Intravenously every 8 hours for at least 24 hours and then switched into oral if patients can tolerate	OND and MET appeared to be equally effective to treat HG
SHAHEEN 2021	Pakistan	n=230 (115/115)	Intravenously every 8 hours for 24 hours	Efficacy and tolerability of OND is better as compared to MET in HG
Moradiha 2022	Iran	n=154 (77/77)	Intravenously every 8 hours for at least 24 hours and then switched into oral if patients can tolerate	OND revealed more efficacy than MET on the HG management

Baseline characteristics of the included studies :(\) Table



Outcomes reported as MD	Effect size	95% CI	P value	I ²
PUQE	0.23	[-0.42, 0.88]	0.49	93%
Length of hospital stay	-0.17	[-0.35, 0.02]	0.08	0%
Number of doses received	0.45	[-0.08, 0.98]	0.1	18%
Duration of IV fluids	-1.73	[-5.79, 2.33]	0.4	0%

Meta-analysis of the included studies :(\) Table

Discussion

Ondansetron is a serotonin receptor antagonist that is effective in treating HG, however, its use should be done with caution owing to potential concerns to both the mother and fetus. On the other hand, metoclopramide is a dopamine antagonist that is equally effective in treating HG with no risk of major congenital malformations, but can cause some serious potential side effects, such as extrapyramidal manifestations. In the present analysis, three RCTs showed better efficacy of ondansetron over metoclopramide, whereas the remaining two RCTs showed no significant difference between both groups. All in all, ondansetron is favored over metoclopramide in view of its trending therapeutic efficacy and better safety profile.